

WHAT IS CLAIMED IS:

CLAIM 1. A miniature laminar ornamental fountain comprising:

a fountain enclosure including a water reservoir;
pump means for pumping liquid to a laminar flow nozzle;
conduit means to conduct liquid from said pump to said laminar flow nozzle;
flow control means for controlling flow between said reservoir and said laminar flow nozzle; whereby water in the reservoir enters the pump means where it is pressurized, thence through said conduit means and said flow control means said laminar nozzle, and whereby the laminar stream emanating from said laminar nozzle forms a graceful arch and then falls back into the reservoir.

Claim 2 A miniature laminar ornamental fountain according to Claim 1 including :

a diffuser located within said enclosure;
said diffuser comprising a porous filter formed into a hollow hemisphere having a convex surface and a concave surface having a center; an exit orifice located generally at said center of said concave surface, whereby as said fluid flows through said hollow hemispherical diffuser it has its Reynold's Number significantly reduced, and any turbulences on said on said convex side of said diffuser tend to be converted to a very great number of micro-turbulences which tend to be self canceling.

Claim 3. An improved nozzle assembly according to claim 2 wherein said diffuser is shaped as a hollow hemisphere and is centered upon said exit orifice substantially all water flowing from the diffuser to the exit orifice has substantially the same distance to travel from substantially all directions, and the fluid exiting said orifice is highly laminar.

Claim 4. An improved nozzle assembly according to claim 1 wherein said diffuser is made of polyester fiber air filter material.

Claim 5. An improved nozzle assembly according to claim 4 wherein material has been heat formed over a hemispherical mandrel.

Claim 6. An improved nozzle assembly according to claim 4 wherein said material is about ½ inch to 1 inch thick.

CLAIM 7. A miniature laminar ornamental fountain comprising:

a fountain enclosure including a water reservoir;

pump means for pumping liquid to a laminar flow nozzle;

conduit means to conduct liquid from said pump to said laminar flow nozzle;

flow control means for controlling flow between said reservoir and said laminar flow nozzle; whereby water in the reservoir enters the pump means where it is pressurized, thence through said conduit means and said flow control means said laminar nozzle, and whereby the laminar stream emanating from said laminar nozzle forms a graceful arch and then falls back into the reservoir: said enclosure including

a generally cylindrical nozzle body having an exit orifice and continuous wall;

an inlet port for causing fluid to enter the nozzle assembly; radially through said wall toward the end opposite from said exit orifice;

a diffuser located within said assembly ;

said diffuser comprising a porous filter formed into a hollow hemisphere having a convex surface and a concave surface having a center; an exit orifice located generally at said center of said concave surface;

a blade located on the inside of said wall directly in front of said inlet port, whereby water entering through said inlet port is forced to flow in a direction in a mild circular flow, whereby said circular flow will tend to distribute water flow and turbulence evenly whereby as said fluid flows through said hollow hemispherical diffuser it has its

Reynold's Number significantly reduced, and any turbulences on said convex side of said diffuser tend to be converted to a large number of micro-turbulences which tend to be self canceling. , and whereby the laminar stream emanating from said laminar nozzle forms a graceful arch and then falls back into the reservoir

Claim 8. A miniature ornamental fountain improved nozzle assembly according to claim 7 wherein said diffuser is shaped as a hollow hemisphere and is centered upon said exit orifice substantially all water flowing from the diffuser to the exit orifice has substantially the same distance to travel from substantially all directions, and the fluid exiting said orifice is highly laminar.

Claim 9. A miniature ornamental fountain improved nozzle assembly according to claim 8 wherein said diffuser is made of polyester fiber air filter material.

Claim 10. A miniature ornamental fountain improved nozzle assembly according to claim 8 wherein material has been heat formed over a hemispherical mandrel.

Claim 11. A miniature ornamental fountain improved nozzle assembly according to claim 9 wherein said material is about 1/2 inch to 1 inch thick.

Claim 12. A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes at least one additional nozzle.

Claim 13. A miniature ornamental fountain improved nozzle assembly according to Claim 12 wherein the additional nozzle comprises a laminar nozzle.

Claim 14. A miniature ornamental fountain improved nozzle assembly according to Claim 12 wherein the additional nozzle comprises laminar or non-laminar nozzles

Claim 15. A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes a fluid pressure pulsation absorbing device comprising an enclosed vessel with at least one elastic bladder-like wall, with at least one inlet port and at least one outlet port.

Claim 16. A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes a fluid pressure pulsation absorbing device comprising an enclosed vessel with at least one inlet port and at least one outlet port, said vessel containing therein a balloon-like, gas filled chamber.

Claim 17. A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes a fluid pressure pulsation absorbing device comprising an enclosed vessel with at least one inlet port and at least one outlet port said inlet port(s) comprising a rigid tube perforated with one or more lateral holes spaced at other than P distance apart, where P is defined as the physical length from peak to peak of one cycle of pressure pulsations generated by an impeller pump, along said rigid pipe.

Claim 18, A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes a fountain nozzle having means to discharge a pressurized stream of water;

a shutter located adjacent said nozzle which prevents or allows said stream to exit;

said shutter integrally connected to a rotatable shaft;

an armature having a tip composed of magnetic material at one end and at the other end, affixed to the said rotatable shaft, whereby the opening and closing of said shutter is controlled by said armature; .

at least two, first and second electromagnets having magnetic cores mounted adjacent said armature tip;

said armature tip positioned in close proximity to said electromagnets such that in one position said armature stays positioned whenever said first electromagnet remains activated, and said shutter continues to block said exit port and no water is discharged;

and whereby by de-activating said first electromagnet and activating said second electromagnet, said armature is made to rotate said shaft and said shutter will

rotate so that it is no longer blocking said exit orifice, and said stream will traverse through said exit aperture, and whereby in order to stop the flow said first electromagnet is deenergized and said second electromagnet is energized to move the armature in the direction to return said armature and said shutter to said first position.

Claim 19. A miniature ornamental fountain control shutter assembly according to claim 18 wherein more than one of said second electromagnets are provided.

Claim 20. A miniature ornamental fountain control shutter assembly according to claim 18 wherein said shaft extends through a cover.

Claim 21. A miniature ornamental fountain control shutter according to claim 19 wherein said second electromagnets are mounted on said cover .

Claim 22. A miniature ornamental fountain improved nozzle assembly according to claim 1 wherein the assembly includes a fountain nozzle having means to discharge a pressurized stream of water;
a shutter located adjacent said nozzle which prevents or allows said stream to exit;
said shutter integrally connected to a rotatable shaft;
means for rotating said shaft and opening said shutter comprising an electrical solenoid mounted on a fixed support having a plunger mechanically connected a lever by a pin said lever in turn mechanically connected to said shutter;
said lever adopted to overcome the force of a tension spring mounted on a fixed support adjacent to said lever; whereby upon de-activating said solenoid, the force of said tension spring pulls said lever to withdraw said plunger , rotates said shaft, and closes said shutter to block fluid flow; and whereby when said solenoid is in an actuated condition in which said plunger is withdrawn, stretched said spring and rotated said lever, rotated said pin and rotated said shutter to uncover said aperture.

Claim 23. A miniature ornamental fountain control shutter assembly according to claim 22 wherein said solenoid is mounted upon a fixed cover by means of a pivot, which permits said solenoid and said plunger to maintain proper alignment with said pin.

Claim 24. A miniature ornamental fountain having an improved nozzle assembly according to claim 1 wherein the assembly includes a fountain nozzle having means to discharge a pressurized stream of water;
a shutter located adjacent said nozzle which prevents or allows said stream to exit;
said shutter integrally connected to a rotatable shaft;
means for rotating said shaft and opening said shutter comprising an electrical solenoid

mounted on a fixed support having a plunger mechanically connected a lever by a pin said lever in turn mechanically connected to said shutter;
said lever adopted to overcome the force of a resilient means mounted on a fixed support adjacent to said lever; whereby upon deactivating said solenoid the force of said resilient means pulls said lever, and closes said shutter to block fluid flow; and whereby when said solenoid is in an actuated condition said resilient means rotates said lever, and moves said shutter to uncover said aperture.

Claim 25. A miniature ornamental fountain having a shutter assembly according to claim 24 wherein said resilient means comprises a mechanical spring.

Claim 26. A miniature ornamental fountain for creating a variable colored lighting effect at some desired remote location according to claim 1 comprising:

multiple source lighting means for lighting at least two colors selected from red, blue, green, yellow and white;

bundles of fiber optic cables having a first end and a second end;

means for illuminating said first end said bundles of fiber optic cables;

means for combining said bundles at said second end into at least one larger cable bundle;

and means for routing said larger cable to a desired remote location.

Claim 27. A miniature ornamental fountain according to claim 26 including lighting means for lighting all the colors selected from red, blue, green, yellow and white.

Claim 28. A miniature ornamental fountain according to claim 27 wherein individual fibers from said bundles are substantially intertwined and mixed into the combined fiber optic bundle whereby the resulting light is comprised of multiple individual points of light, and the resulting color comprises a mix of said originating source colors.

Claim 29. A miniature ornamental fountain according to Claim 1 comprising:

a fountain base having a substantially watertight seal;

multiple source lighting means for lighting at least two colors selected from red, blue, green, yellow and white.

bundles of fiber optic cables having a first end and a second end;

means for illuminating said first end said bundles of fiber optic cables;

means for combining said bundles at said second end into at least one larger cable bundle;

means for routing said larger cable into said base and through said seal;

said fountain having an inlet port and a fountain nozzle;

means for supplying pressurized water into said inlet port, and into said fountain nozzle;

means for creating an output stream; and

means for illuminating output stream with said cable in said fountain.

Claim 30. A miniature ornamental fountain according to Claim 29 comprising:

multiple source lighting means for lighting at least two colors selected from red, blue, green, yellow and white;

bundles of fiber optic cables having a first end and a second end;

means for illuminating said first end said bundles of fiber optic cables;

means for combining said bundles at said second end into at least one larger cable bundle;

and means for routing said larger cable to a desired remote location.

Claim 31. A miniature ornamental fountain according to claim 30 including lighting means for lighting all colors of red, blue, green, yellow, and white

Claim 32. A miniature ornamental fountain according to claim 31 wherein individual fibers from said bundles are substantially intertwined and mixed into the combined fiber optic bundle whereby the resulting light is comprised of multiple individual points of light, and the resulting color comprises a mix of said originating source colors.

Claim 33. A miniature ornamental fountain comprising:

a fountain base having a substantially water light seal;

multiple source lighting means for lighting at least two colors selected from red, blue, green, yellow and white;

bundles of fiber optic cables having a first end and a second end;

means for illuminating said first end said bundles of fiber optic cables;

means for combining said bundles at said second end into at least one larger cable bundle;

means for routing said larger cable into said base and through said seal;

said fountain having an inlet port and a fountain nozzle;

means for supplying pressurized water into said inlet port, and into said fountain nozzle;

means for creating an output stream and

means for illuminating output stream with said cable in said fountain.

Claim 34. A miniature ornamental fountain according to Claim 33 including means for varying illuminated color.

Claim 35. A miniature ornamental fountain according to Claim 34 including means for varying illuminated color intensity within the limits of said color light sources.

Claim 36. A miniature ornamental fountain according to Claim 30 including means for varying illuminated color intensity within the limits of said color light sources.